DSP67

Mead M 67

Diarium Scratch Pad

COMPOSITION

VOTH E

~~LOGS~~ [2003.036

[2000.353 2005.008

100 sheets • 200 pages
9¾x7½ in/24.7 x 19.0 cm
college ruled • 09932

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B-101

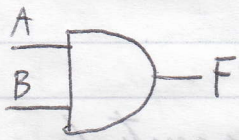
DIARIUM # 67

COLLEGE RULED

De Morgan Transformations

1. Exchange AND for OR and vice versa.
2. Invert all variables, exchange 0's for 1's
3. Invert the entire function
4. Reduce all multiple inversions.

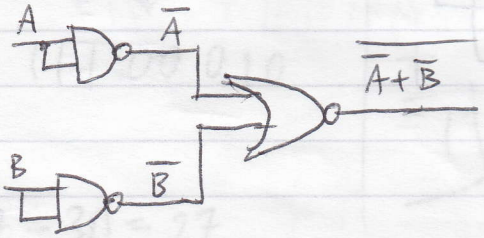
$F = AB$



1. $A + B$
2. $\bar{A} + \bar{B}$
3. $\overline{\bar{A} + \bar{B}}$

A	B	F
0	0	0
0	1	0
1	0	0
1	1	1

$\bar{A}$	$\bar{B}$	$\bar{A} + \bar{B}$	$\overline{\bar{A} + \bar{B}}$
1	1	1	0
1	0	1	0
0	1	1	0
0	0	0	1



Minterms and Maxterms

Sum of Products

Product of Sums

A	B	C	minterms	maxterms
0	0	0	$\bar{A}\bar{B}\bar{C}$	$A+B+C$
0	0	1	$\bar{A}\bar{B}C$	$A+B+\bar{C}$
0	1	0	$\bar{A}B\bar{C}$	$A+\bar{B}+C$
0	1	1	$\bar{A}BC$	$A+\bar{B}+\bar{C}$
1	0	0	$A\bar{B}\bar{C}$	$\bar{A}+B+C$
1	0	1	$A\bar{B}C$	$\bar{A}+B+\bar{C}$
1	1	0	$AB\bar{C}$	$\bar{A}+\bar{B}+C$
1	1	1	ABC	$\bar{A}+\bar{B}+\bar{C}$

example

A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

→ Product of Sums

$$F = (A+B+C)(A+\bar{B}+C)(\bar{A}+\bar{B}+C)(\bar{A}+\bar{B}+\bar{C})$$

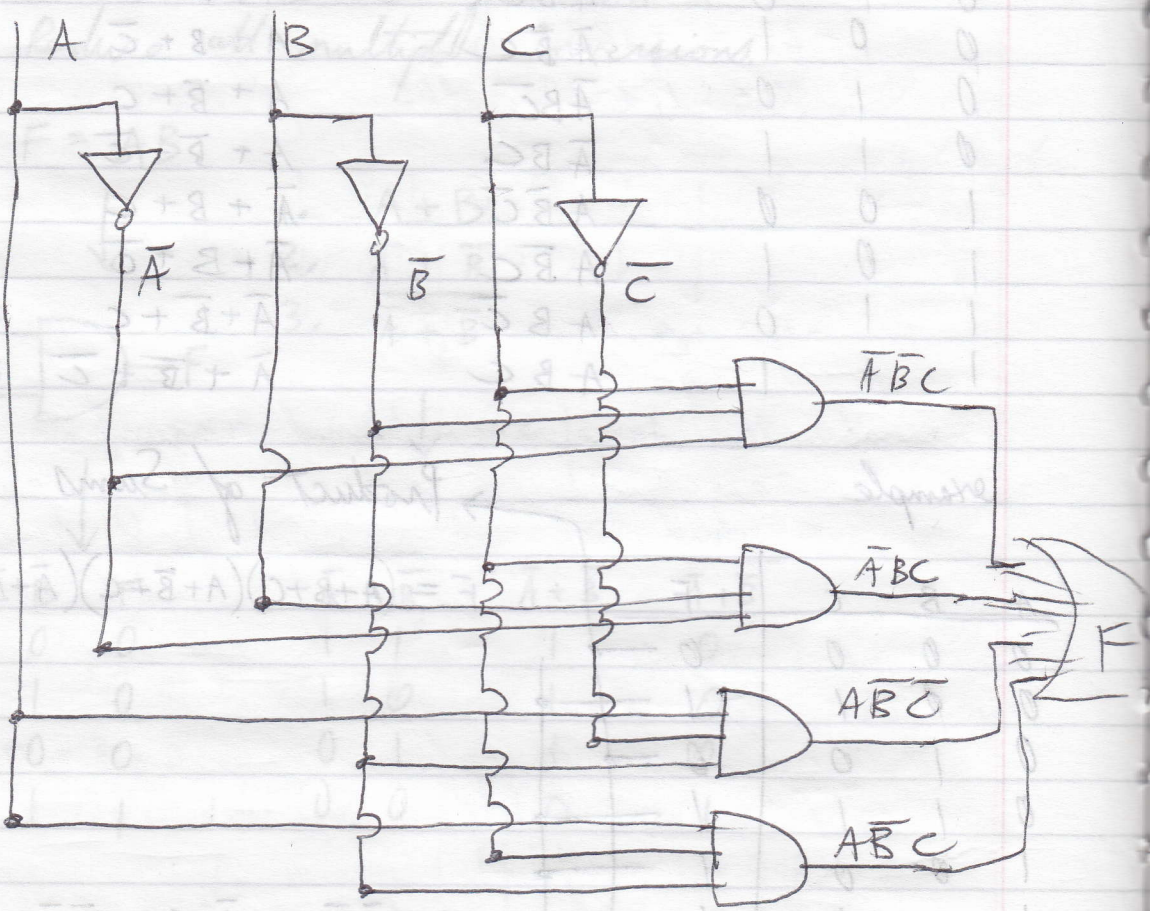
$$F = \bar{A}\bar{B}C + \bar{A}BC + A\bar{B}\bar{C} + A\bar{B}C$$

→ Sum of Products

Sum of Products

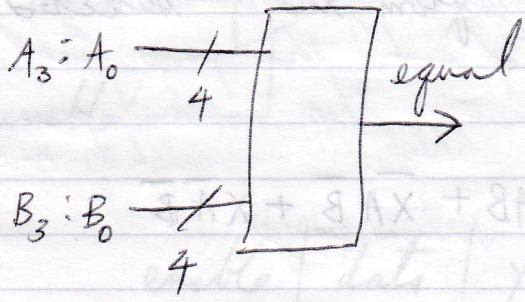
~~F = (ABC)'~~

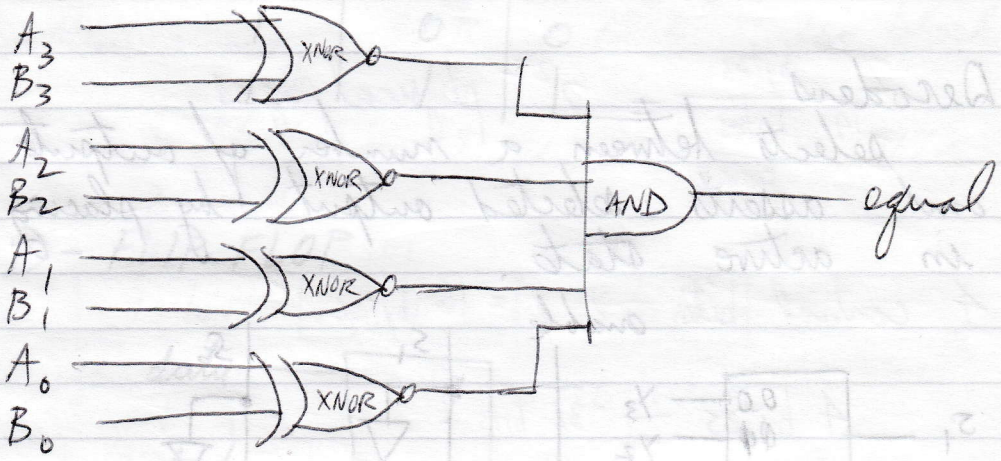
$F = \bar{A}\bar{B}C + \bar{A}BC + A\bar{B}\bar{C} + A\bar{B}C$



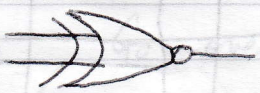
More complex functions (using primitive logic functions)

equality comparator





what does XNOR look like?



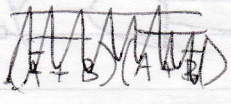
how?

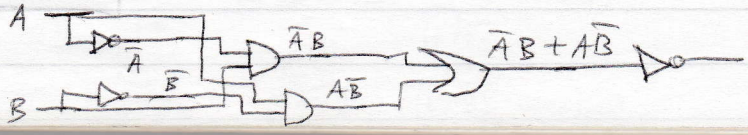
OR → $A + B$

XOR → ~~$(A \cdot \bar{B}) + (\bar{A} \cdot B)$~~

$(\bar{A}B) + (\bar{B}A)$

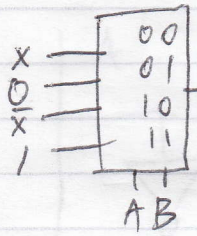
XNOR → $\overline{\bar{A}B + A\bar{B}}$





Multiplexers

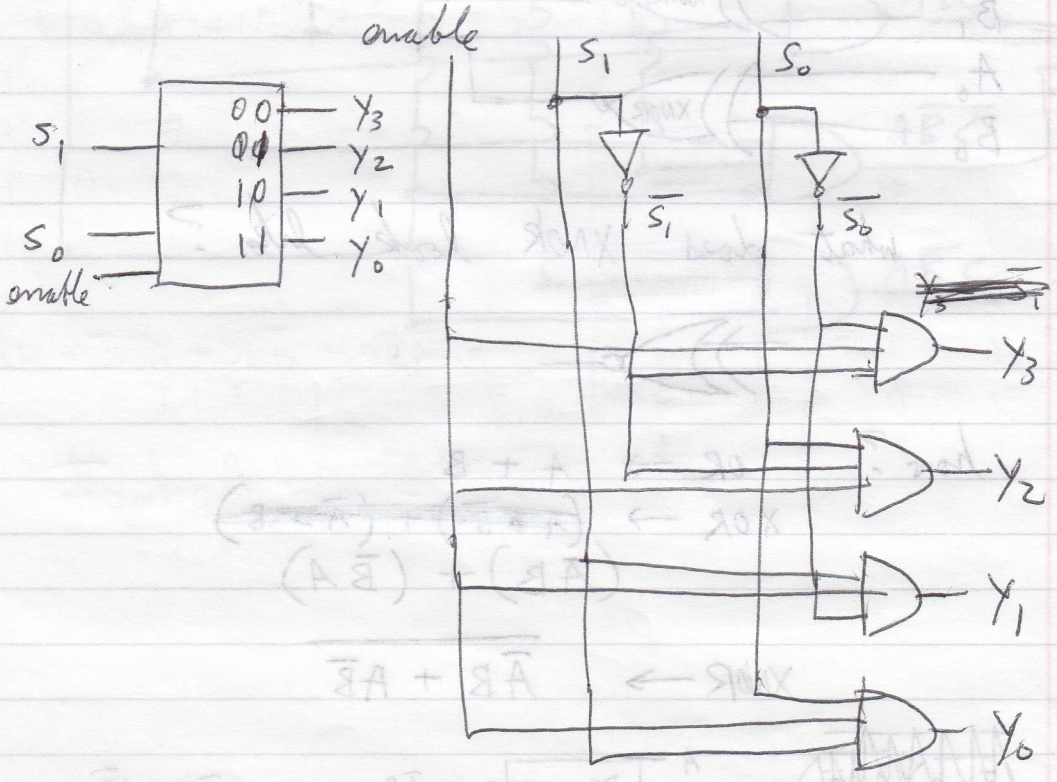
selects between a number of inputs and conveys the data from the selected input to the output.



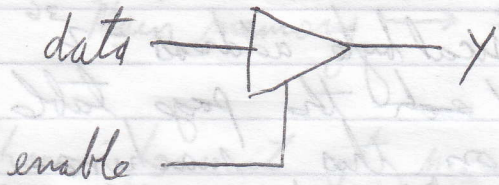
$$F = AB + \bar{X}A\bar{B} + X\bar{A}\bar{B}$$

Decoders

selects between a number of outputs and asserts selected output by placing it in active state.

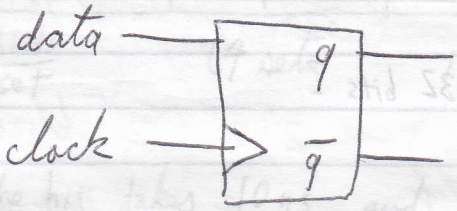


Tri-State Buffer



enable	data	y
0	0	∅
0	1	∅
1	0	0
1	1	1

D-FLIP FLOP



idea: relax. Go over problems in t/s and work book.

The algorithm:

1. point off argument by twos
2. Write down first square root (by inspection)
3. Subtract its square from first 2 digits.
4. Obtain the remainder by drawing down the next 2 digits.
5. Double the square root and append a zero. (20a)
6. Estimate the next root digit by dividing the remainder by this number.
7. Verify the digit by substituting it as the last digit of the divisor.
8. Multiply the last digit by the divisor
9. Subtract to get the new remainder.
10. Repeat from step 5 until done.

Let's try ~~5~~ 1,234,567,890

```
                3   5   1   3   6
            ------------------------
            12  34  56  78  90
          - 9
            ---
            3   34
          - 3   25
            -------
                9   56
              - 7   01
                ------
                2   55  78
              - 2   10  69
                ----------
                    45  09  90
                    42  15  96
                    ----------
                     2  93  94
```

60 | 65 | 3 34 − 3 25

700 | 701 | 9 56 − 7 01

7020 | 7023 | 2 55 78 − 2 10 69

70260 | 70266 | 45 09 90 − 42 15 96

→ 2 93 94 remainder

$$\begin{array}{r} 5 \\ 60\overline{)334} \\ 300 \\ \hline 34 \end{array} \qquad \begin{array}{r} 5 \\ 65\overline{)334} \\ 325 \\ \hline 11 \end{array}$$

~~#~~ double 35, not just 5

$$\begin{array}{r} 1 \\ 700\overline{)956} \\ 700 \\ \hline 256 \end{array} \qquad \begin{array}{r} 1 \\ 701\overline{)956} \\ 701 \\ \hline 255 \end{array}$$

$20(351) + 6 = 7020 + 6$

$$\begin{array}{r} 5 \\ 7023\overline{)25578} \\ 21069 \\ \hline 4509 \end{array} \qquad 20(3513) = 70260$$

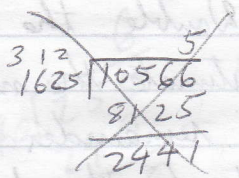
$$\begin{array}{r} 6 \\ 70260\overline{)450990} \\ 421560 \\ \hline 29430 \end{array}$$

So, let's try an easier one:

$$\sqrt{666666}$$

```
        8   1   6
    ------------------
    | 66  66  66
    | 64
160 | 161  266
    |      161
    |     ------
320 | 1626 10566
    |      9756
    |     ------
    |        810
```

↗ remainder



100

1020

check:

```
      1 4
      816
    × 816
    -----
     4896
    8160
  652800
  ------
  665856
```

```
  1
665856
   810
------
666666 ✓
```

practice makes perfect: $\left((2^6)^2\right)^2 = (2^{16})^2 = 2^{18}$

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ 1} \\ 65536 \\ 65536 \\ \hline 131072 \end{array} = 2^{17}$$

$$131072 = 2^{18}$$

$$\begin{array}{r|l} & 5\ 1\ 2 \\ \hline & 26\ 21\ 44 \\ & 25 \\ 100 \quad 101 & 1\ 21 \\ & 1\ 01 \\ \hline 1020 \quad 1022 & 20\ 44 \\ & 20\ 44 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ 101\overline{)121} \\ 101 \\ \hline 20 \end{array}$$

$$512^2 = 262144$$

$$(2^9)^2 = 2^{18} \quad \checkmark$$

$$\begin{array}{r} 51 \\ 20 \\ \hline \end{array}$$

$$20(51) = 1020$$

$$\begin{array}{r} 2 \\ 1020\overline{)2044} \\ 2040 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 2 \\ 1022\overline{)2044} \\ 2044 \\ \hline \end{array}$$

2000.358.12,23.6.00:30

infinite series:

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \frac{x^{11}}{11!} + \cdots$$

$$\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \frac{x^{10}}{10!} + \cdots$$

$$\sin_n x = -(1)^n \frac{x^{2n+1}}{(2n+1)!} \qquad (n = 0, 1, \ldots)$$

$$\cos_n x = -(1)^n \frac{x^{2n}}{(2n)!}$$

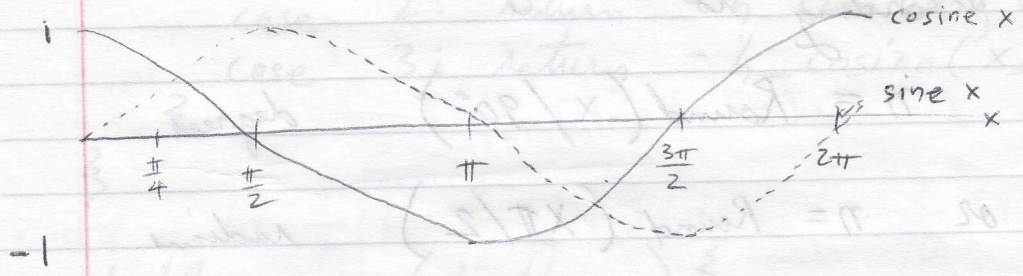
It is these series that were used, and still are, to calculate the tables in trig books. Generating these tables was the purpose behind Charles Babbage's Difference Engine back in 1823. The Difference Engine was never built, but it was designed in 1823.

Instead of producing tables, modern programmers are faced with computing the values in real time as they are needed.

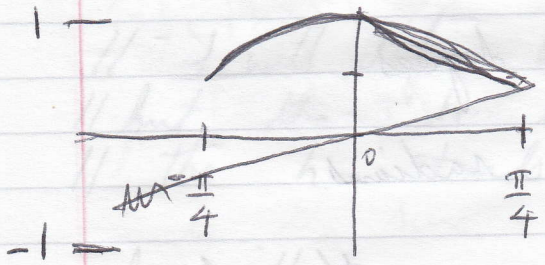
What are the practical ramifications of this need?

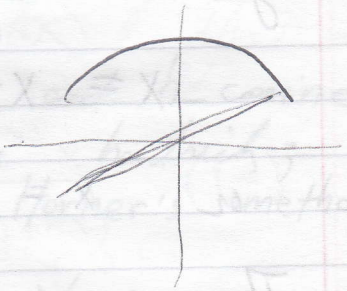
Range Reduction to $-45°$ to $45°$ $\left(-\frac{\pi}{4} \text{ to } \frac{\pi}{4}\right)$

recall

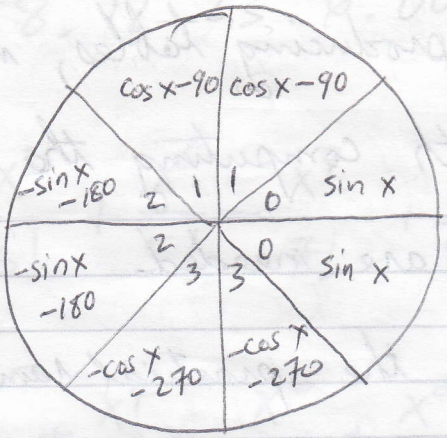


reduce to





2



shifting 90° quadrants 45° counter clockwise

Each quadrant has been assigned a number according to

$$n = \text{Round}(x/90^\circ) \quad \text{degrees}$$

$$\text{or} \quad n = \text{Round}(x\pi/2) \quad \text{radians}$$

I can then reduce the angle to its essence by subtracting the appropriate value.

$$x = x - 90n \quad \text{degrees}$$

$$\text{or} \quad x = x - \frac{\pi n}{2} \quad \text{radians}$$

The quadrant number may then be found by taking $n \bmod 4$.

Note that I don't need a separate set of computations to compute the cosine. I merely add $90° = \frac{\pi}{2}$ radians to the angle and call the sine.

The Sine Function

```
double sine (double x) {
    long n = (long)( x/(pi/2) + 0.5 );
    x -= n * (pi/2);
    n = mod (n, (long) 4);
    switch (n) {
        case 0: return h_sine (x);
        case 1: return h_cosine (x);
        case 2: return - h_sine (x);
        case 3: return - h_cosine (x);
    }
}

double cosine (double x) {
    return sine (x + (pi/2));
}

// I will define both h_sine and h_cosine,
// but the h is not for hentrich;
// the h stands for Horner's method
```

I will go over Horner's method.

recall $\sin_n x = \pm (-1)^n \frac{x^{2n+1}}{(2n+1)!}$

The next term in the series would be $\sin_{n+1} x$.

$$\sin_{n+1} x = (-1)^{n+1} \frac{x^{2(n+1)+1}}{(2(n+1)+1)!}$$

$$= (-1)^{n+1} \frac{x^{2n+2+1}}{(2n+2+1)!}$$

$$\sin_{n+1} x = (-1)^{n+1} \frac{x^{2n+3}}{(2n+3)!}$$

Taking the ratio $\frac{\sin_{n+1} x}{\sin_n x} =$

$$\frac{(-1)^{n+1} \frac{x^{2n+3}}{(2n+3)!}}{(-1)^n \frac{x^{2n+1}}{(2n+1)!}} = \frac{-x^2(2n+1)!}{(2n+3)!}$$

Let this ratio R_{n+1} be given by

$$R_{n+1} = \frac{-x^2}{(2n+3)(2n+2)}$$

We can factor

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \frac{x^{11}}{11!} + \ldots$$

and

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \frac{x^{10}}{10!} + \ldots$$

as $z = x^2$

$$\sin x = x\left[1 - \frac{z}{6}\left(1 - \frac{z}{20}\left(1 - \frac{z}{42}\left(1 - \frac{z}{72}\left(1 - \frac{z}{110}\left(1 - \ldots\right)\right)\right)\right)\right)\right]$$

and

$$\cos x = 1 - \frac{z}{2}\left[1 - \frac{z}{12}\left(1 - \frac{z}{30}\left(1 - \frac{z}{56}\left(1 - \frac{z}{90}\left(1 - \ldots\right)\right)\right)\right)\right]$$

Horner's method is the optimal way to calculate the series. Note that the denominators at each step are the products of two successive integers:

in the sine: $2\cdot3,\ 4\cdot5,\ 6\cdot7,\ \ldots$

in the cosine: $1\cdot2,\ 3\cdot4,\ 5\cdot6,\ 7\cdot8,\ 9\cdot10,\ \ldots$

```
// Find the Sine of an Angle <= 45 degrees
double h_sine (double x) {
    double s1 = 1/(2*3);
    double s2 = 1/(4*5);
    double s3 = 1/(6*7);
    double s4 = 1/(8*9);
    double z = x*x;

    return ((((s4*z-1)*s3*z+1)*s2*z-1)
            *s1*z+1)*x;
}

// Find the Cosine of an Angle <= 45 degrees
double h_coside (double x){
    double c1 = 1/(1*2);
    double c2 = 1/(3*4);
    double c3 = 1/(5*6);
    double c4 = 1/(7*8);
    double z = x*x;

    return ((((c4*z-1)*c3*z+1)*c2*z-1)
            *c1*z+1);
}
```

These forms were derived via transformations.

Hence

$$\sin x = x\left[1-\frac{z}{6}\left(1-\frac{z}{20}\left(1-\frac{z}{42}\left(1-\frac{z}{72}\left(1-\ldots\right)\right)\right)\right)\right]$$

becomes

$$\sin x = -\left[-\left(-\left(-\left(\ldots\frac{z}{72}-1\right)\frac{z}{42}-1\right)\frac{z}{20}-1\right)\frac{z}{6}-1\right]x$$

$$= \left[\left(\left(\left(\ldots\frac{z}{72}-1\right)\frac{z}{42}+1\right)\frac{z}{20}-1\right)\frac{z}{6}+1\right]x$$

and

$$\cos x = \left[\left(\left(\frac{z}{56}-1\right)\frac{z}{30}+1\right)\frac{z}{12}-1\right]\frac{z}{2}+1$$

e^x is represented as $\ln x$

$$\log_{10} x = \frac{\ln x}{\ln 10}$$

$$\log_2 x = \frac{\ln x}{\ln 2}$$

In floating-point notation, the number is stored in the format $x = 2^n f$

While taking the antilog, the fractional part gives the value of the digits of the number, while the integral part fixes the position of the decimal point:

$$10^x = 10^{(n+f)} = (10^n)(10^f)$$

where f is the mantissa constrained between 0.5 to 1.0. In taking the logarithm, you are really finding $\ln x = \ln (2^n f)$

which is

$$\begin{aligned} \ln x &= \ln(2^n) + \ln f \\ &= n \ln 2 + \ln f \end{aligned}$$

It doesn't matter what the base is for the floating point exponent. You need only remember to multiply n by the natural log of whatever the base is.

Horner's method applied to e^x:

$$e^x = 1 + x\left(1 + \frac{x}{2}\left(1 + \frac{x}{3}\left(1 + \frac{x}{4}\left(1 + \frac{x}{5}\left(1 + \frac{x}{6}\left(\cdots\right)\right)\right)\right)\right)\right)$$

or

$$e^x = \left(\left(\left(\left(\left(\left(\cdots\right)\frac{x}{6} + 1\right)\frac{x}{5} + 1\right)\frac{x}{4} + 1\right)\frac{x}{3} + 1\right)\frac{x}{2} + 1\right)x + 1$$

Range reduction: input argument as $x = n + f$

then we can write $e^x = e^{(n+f)} = (e^n)(e^f)$

Nati will make a strong young man very happy. I could not attempt to compete with her people for her affections.

2003 011 J11 Sat 03:21

Nati came through SR at 12:35 on Sp - I was able to ask her personally if she had family she supported. She said, NO - just her. I had left 6-12 at 11PM very sad because I am afraid I do love her. Of course, I am very aware of how young she is. Here I sit at 7-11 drinking coffee on lunch break.

Hours? Sat, Mon, Thurs?
11, 13, 16 3 days only

I will call Dad sometime Saturday to give him my hours.

I know Nati went to Shop Rite for food, but at least I did see her.

And while she confessed to me that she hates the 6-12, at least I was able to exclaim, "It was good seeing you."

She was so beautiful tonight. I can still admit my feelings to myself, even if barriers will keep us apart.

011 08:10 I got a call on my machine at 11:55PM. All the angry male said was, "She's married asshole."

Someone knows I am interested in Nati. I asked her about family, but she never said she was married. Now, someone calls at 11:55PM when I know the 6-12 closes at midnight AND their clock is 5 minutes fast.

So, who has called me?

How did he get my name/number?

So, perhaps Dougie the disabled dude told a male friend of Nati's that I was asking if she had a husband.

So, will I get knifed if I continue to pursue her?

Why did the other girl seem surprised that Nati went to Shop Rite last night? I told her that seeing Nati's face was like seeing the sun come out.

Now, will I find out who this fucker is who called me on the phone to warn me to stay away from her? Who the fuck was it? Was it a man who only wants to keep Nati from being discovered?

2003 011 12:49 36>=23 56>=43

ready for EDUCATION w/ OFFSPRING.

ready for younger me?

(PS2) lead into idea.

from Latin root nat = "to be born" (nasci ↓ natus → birth)

natio = name of birth goddess

GB2 → (the history of the word, idea, carries us back to a time when the human mind could not think of its own thoughts, "apperceive".) include in letter to Nati as a note after feeling/idea. (see Post Scriptum)

NATI, the rest of the PS is typed and not translated as it is not related to the Letter itself.

Until Platos time, the word idea (from ΙΔΕΙΝ = "to see") meant the form or appearance of a thing.

Plato understood Idea not as something which existed solely in his own mind, but as Eternal Beings which stood behind the ever-changing forms of material nature.

Nominative → subject, agent of verb

Genitive → possession

Dative → indirect object (give something to someone)
Accusative → direct object (thing acted upon)
Ablative → carrying away from / external source
Vocative → addressing someone (calling)

→ Distrusting the information gained from the senses because of the obvious transcience of all sense-phenomena,

the Academics would only give the name of knowledge (ἐπιστήμη) to the contemplation of those underlying and undying Ideas.

phenomena = "things which appear"

We witness the gradual evolution of the intellectual faculties.

Aristotle and his merry men believed they could trace the origin of the thing-in-itself (like TREE LIFE) by tracing the origin of the word and when it came into being.

LOGOS → that which pertains to a word or a thought

Logicisi → to work with words and thoughts
→ to "reason"

The judgement of sense is not within the senses. Although it arises from sense data, the judgement of truth is not in the senses.

While the word idea is derived from the verb "to see", the word species is derived from ~~a verb~~ specio, also meaning "to see", but it is a more acute kind of seeing.

Recap: Knowledge as soul's intellici (essential potential quality), epistemi (ΕΠΙΣΤΗΜΗ)

~~Theoria~~ Investigation by full participation in the observation of Nature, to become one with it and merge with the process of being.

Theory is not just a mental construct, but the act of "OBSERVING BEING".

PS 3 Nature → physis, kind, physical

Latin PHUSIS → phusis = "coming to be"

If you go back far enough, (g)nasci and kind have a common root, gena (gene). Phusis has a different origin.

① inhabit, live, dwell, remain, be
② "to grow", "to become"

There were 3 principle movements towards the demotion of phusis.

PLATONISM: The whole perceptible universe in space and time is an imitation, and product, of something different: the imperceptible, timeless, archetypal forms.

This product ~~itself~~ comes to be itself called physis.

ARISTOTELIAN: Phusis as that which has in itself a principle of change, the subject of natural philosophy (physike, "physics").

This brings in the age of universities where phusis (demoted sense) is demoted to "the subject of a particular discipline".

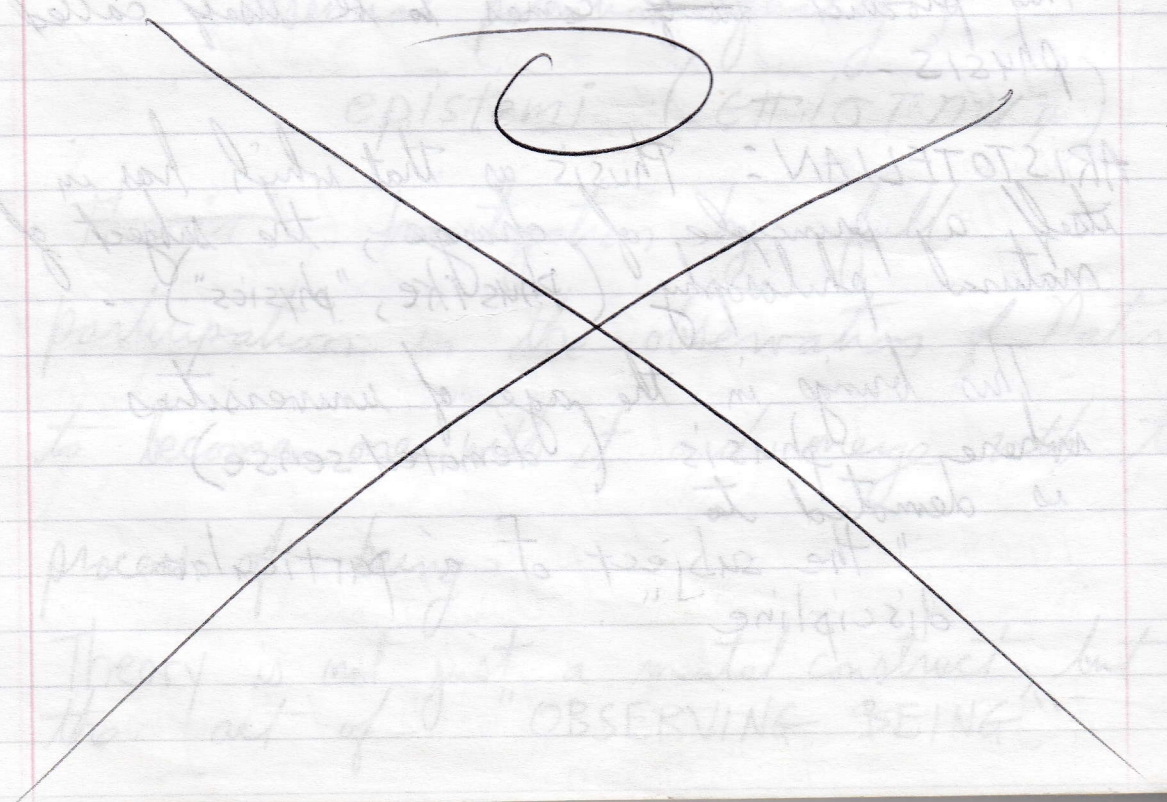
THE CHRISTIAN:

(Involves a God inherited from Judaism and could also have been inherited from Plato's Timaeus).

— The conception that this God is the Creator of phusis.

~~Nature (denoted sense)~~

Nature (denoted sense) is now both distinct from God and also related to God as artifact ~~to~~ is related to artist.



~~uno~~ cero (order is arbitrary)

KEY

Location ↔ l α ↔ address (minus state, zip)

N ↔ name → n

R ↔ company url → r #: phone

P ↔ position → p

P_T ↔ position type → p_t

I ↔ industry → i

M ↔ major is computer science : else " ~~M~~ { names of majors sought } "

when m=1, major → Computer Science
when m=0, NOT CS in particular
+ { LIST } : other areas sought for this position.

√ # uno l = Philadelphia, PA 19107 p_t = full time

n = Accenture p = consultant

r = www.campusconnection.accenture.com i = Comp. Consulting

m = 1 + { all Engineering, IT/MIS/CIS }

α = "Johanna Leon

~~Wanna~~

Wanamaker Building, 100 Penn Square East"

√ # dos l = Newark, NJ 07114

n = ANHEUSER-BUSCH COMPANIES, INC - Newark Brewery

α = " Sandra Williams-Steele

200 US 1 " # = 1973-645-7829 Ext?

r = www.buschjobs.com

p = engineer, information technology t = full, intern ~~T~~

i = ENGINEERING m = ∅ + { IT }

¿ # tres? Not enough room. Leave free for keys.

$X_{\not\alpha}$ means further, deeper contact (updated).

tres l = South Plainfield, NJ 07080

i = TELECOMMUNICATIONS

p_t = full time, intern r = W. aretechnologies.net

p = Information Technology Systems Engineer m = 1 + {Comp Eng, EE, IT}

π = 1908-822-9870 α = " Sundeep Patel
1331 Hogan Drive "

ext = $\emptyset$ or {}

---

cuatro l = Warren, NJ 07059

α = " Stacey Homler
10 Independence Blvd " π = 1908-605-3694

r = at&t r = w.att.com p = engineer

p_t = full time i = TELECOMMUNICATIONS

m = 1 + {EE}

---

cinco [*****] l = Washington, D.C. 20212

n = Bureau of Labor Statistics p = programmer, software developer

π = 1202-691-6732 m = 1 + {IT}

p_t = full ENGINEERING

α = " Sang Kang
2 Massachusetts Ave NE " i = GOVERNMENT

α_N : Richard Fecher π_N : 1202-691-7552

apply under Outstanding Scholar $5,000 signing bonus

l_N = Maryland or Virginia close to District of Columbia

Seis

ℓ = Durham, NC 27703

p = consultant p_t = full time i = Management Consulting

κ = w.clarkstonconsulting.com α = "Deana Brannan
n = Clarkston Consulting 1007 Slater Road Suite 400"

π = 1800-652-4274 [ext = 4423]

---

siete ℓ = Morristown, NJ 07960

i = SOFTWARE development/design

p = (programmer), QA Rep, developer p_t = FT

m = 1 + {Comp Eng} practice with Mozilla 1.3a QA

n = Dendrite $\mathcal{N}_1$ = "database warehouse"

Post resume on-line

α = "Gail Miller
1200 Mount Kemble Avenue"

---

ocho l = New Fairfield, CT 06812
π = 1203 - 746 - 4952 ext = ~~##~~ {}
n = ibm r = w.ibm.com/careers pt = coop, intern, FT
i = "Business Services" m = 1 + {EE, Comp Eng}
N1 = "IBM stands for International Business Machines"
p = programmer, software developer
α = " Eletta Kershaw
PO Box 8084 "

---

nueve l = Clark, NJ 07066
α = "Carolyn Hofseth
133 Terminal Ave " π = (732) 680-5532
p = programmer, QA, InfoTech, Systems Engineer
pt = FT, intern m = 1 + {all engineering}
i = Consumer Products (perfume and beauty shit)
r = w.loreqlusa.com

# diez l = ~~Camden~~ Camden, NJ 08102
n = L-3 Communications π = 1856-338-4203
α = "Patricia Spruill pt = FT
1 Federal Street A&E 1C "
i = SOFTWARE development/design
m = 0 + {all majors}

---

once l = Bethesda, MD 20817 n = LOCKHEED MARTIN
π = 1301-214-9928
p = IT, programmer, scientist, software developer
Systems Analyst, Web Developer pt = FT
i = AEROSPACE α = "Carol Davis
m = 1 + {MANY} 6801 Rockledge Drive "
r = w.lockheedmartin/careers.com

√ # doce ℓ = Little Silver, NJ 07739
n = LOG-NET, INC α = " Kathleen Hedden
180 White Road Suite 101 "

π = (732) 747-7699 ←
MWH : (732) 431 (7699) ↙

r = W. LOG-NET. com
i = SOFTWARE D/D

p = IT, Project Manager, Programmer, Software Developer
p_t = FT m = 1 + { Comp. Eng }

N₁ → RED BANK (JAVA, C++, HTML, Javascript)

√ # trece ℓ = Warren, NJ 07921
i = telecommunications
n = Lucent Technologies
m = 1 + { EE, Comp E }
π = 1908- ~~282~~ 559 -~~6400~~ 4240
r = W. lucent. com

p = Software Dev
α = " Donna Satterthwaite
283 King George Road
Room 3IC37 "

√ # catorce ℓ = Coopersburg, PA 18036-1299
π = 1610 282 6400
i = ELECTRONICS (hardware & software)
N₁ : five miles from Allentown
α = " Pat Heimbach
7200 Suter Road "

n = Lutron Electronics
r = W. lutron. com

p = Software developer, Engineer
m = 1 + { Comp E, EE, ME, Math, Physics }

quince ℓ = New York, NY 10080

π = 1212-449-2305 α = "Arshi Gyani
4 World Financial Center
2nd floor"

ρ = programmer, web developer

m = 1 + {all E}

i = Financial Services, Investment Banking

ν = ?

---

dieciseis ℓ = Redmond, WA 98052

i = Software Development/Design ρ = i

ν = W. Microsoft.com/college/

m = 1 + {all majors, all business, all sciences} ρt = FT, coop

α = "Heather Raschko
One Microsoft Way 19/1026"

π = 1425-703-2112

N1 = .NET

N2 = relocate
YES $

---

diecisiete ℓ = New York, NY 10019

η = Morgan Stanley Information Technology

ρ = programmer, analyst m = 0 + all

i = banking ν = W. morganstanley.com/careers

π = 1212-762-2496

I ~~X~~ NY

---

dieciocho ℓ = Mercerville, NJ 08619

π = 1609-588-5500 ext = 228

η = Novasoft IT Corporation i = Internet/Information

α = "Shivakumar, Rajam
3570 Quaker Bridge Road"

ρ = IT, software developer
Web Developer

ν = W. novasoftinfo.com

m = 1 + {Business, IT/MIS}

diecinueve ℓ = Columbia, MD 21044

OFFICE LOCATION
Actual job is 100% travel
SAP Development

n = RWD Technologies r = w.rwd.com
p = Technical Writer, Web Developer, Software Dev
i = Computer Consulting
m = 1 + { MBA }
M = build educational software that teach people how to use software itself.
α = " Leigh Patterson
10480 Little Patuxent Parkway "

π = 1888 - 793 - 9675 ext = 5377

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viente ℓ = PISCATAWAY, NJ 08854
π = (732) 699 2314
α = " Phyllis A. Clay
45 Knightsbridge Road "

n = TELCORDIA Technologies, INC
r = insite.telcordia.com/
i = telecommunications
m = 1 + EE
p = programmer, Software Dev

# viente uno ℓ = Blue Bell, PA 19424
i = IT m = 1 + { EE, Comp E, Math }
p = consultant, systems analyst
r = w.unisys.com π = 1215 - 986 - 3036
α = " Susan Holtz
Unisys Way, M.S. E6-121 "

# viente dos l = Warren Twp, NJ 07059
n = Verizon Wireless π = 1908-607-7343
ι = W.verizonwireless.com p = IT i = Telecomm.
m = 1+ { EE, Comp E }
α = " Andrew Wrubel
30 Independence Blvd. "

send resume on-line

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viente tres n=BLACKROCK l = NY, NY 10022
skip it NY

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viente cuatro l = New Brunswick, NJ 08933
π = (732) 524-2857 n = Johnson & Johnson
ι = HEALTH CARE p = engineer
α = " Teresa Toole One Johnson & Johnson Plaza "

# viente cinco l = Bridgewater, NJ 08807
n = MARKETRX, INC.
i = Biotech ι = W.marketrx.com
p = analyst, operations research, technical writer
π = 1908-541-0045
ext = 323 m = 1+ { Appl. Engr., Math, OP }
α = " Nasir Khan
1011 US Route 22 (W), 2nd floor "

NAVY CIVILIAN JOBS ? NO THANKS. to PA

# viente seis l = SAN DIEGO, CA 92121
p = engineer pt = FT, intern
i = telecommunications n = QUALCOMM
π = 1858-651-6852 ι = w.qualcomm.com
m = 1+ { Comp E, EE } α = " Hilda Ransom
5775 Morehouse Drive "

#27 ℓ = Tewksbury, MA 01876

ι = ENGINEERING ρ = software engineer

ν = rayjobs.com/campus m = 1+ {Aero E, Comp E, EE, ME, Math, Physics}

n = RAYTHEON COMPANY

π = 1978-858-5900

α = "Donna McIntosh
50 Apple Hill Drive, M/S T2SL2

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leave blank for keeping track of callbacks, email, etc

After these, and only after those, go to Hall of Records to apply for County Job.